

OIL & GAS DOCKET NO. 7C-0232281

**THE APPLICATION OF EOG RESOURCES, INC., FOR INCREASED GAS/OIL RATIO
AUTHORITY FOR THE SHEFFIELD, SE (DEVONIAN) FIELD, TERRELL COUNTY,
TEXAS**

Heard by: Margaret Allen, Technical Hearings Examiner

Procedural history

Application received: August 22, 2002

Hearing held: October 14, 2002

Appearances

Richard Johnston

Representing

EOG Resources, Inc.

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

EOG Resources is seeking increased gas/oil ratio authority to allow oil wells in the Sheffield, SE (Devonian) Field to produce up to 3000 MCF per day and seeking cancellation of all overproduction in the field.

DISCUSSION OF THE EVIDENCE

The Sheffield, SE (Devonian) gas field was discovered in 1980 at a depth of 8941', and has nine gas wells. EOG operates seven of the gas wells and completed the first oil well in the field in April, 2002. EOG's Noelke A Lease Well No. 3801H is a horizontal wellbore completed with an initial potential of 100 BOPD and a gas/oil ratio of 2510 cubic feet per barrel. This well is already shut-in after producing only 4360 BO and 16,460 MCF.

In July, 2002, EOG completed the Noelke 4 Lease multi-lateral Well No. 2H was completed as the second oil well. This well's initial potential was 131 BOPD with an oil gravity of 40 degrees and a gas/oil ratio of 31,267 cubic feet per barrel. It may eventually be reclassified as a gas well because its gas/oil ratio has been increasing over time. The well's ultimate production is predicted to be 11,000 BO and 609 MMCF.

The Devonian reservoir has significant lateral and vertical heterogeneity. There does not appear to be any structural control of a gas/oil horizon and there is probably no single gas cap present. This field has been developed with multi-lateral wells and even wells whose laterals are very close together can have significantly different characteristics. The Noelke 4 Lease Well No. 1H lateral extends in between the laterals of the oil well, No. 2H, yet Well No. 1H is a gas well with a gas/oil ratio of 138,000 cubic feet per barrel and condensate gravity of 51 degrees.

The oil well, Noelke 4 Lease No. 2H, will drain an estimated 38 acres, based on 9% porosity and net pay of 95'. As its laterals are 3897' long, the drainage area can be assumed to be only 424' wide. Even nearby wells may contact unconnected parts of the reservoir.

Statewide Rules apply to the Sheffield, SE (Devonian) Field, which therefor has a top allowable of 142 barrels of oil and 284 MCF of gas per day. The Noelke 4 Well No. 2H's allowable is penalized to 9 BOPD due to its high gas/oil ratio. This application will allow gas wells to produce as much extra gas as oil wells are allowed it with the increase net gas/oil ratio authority. Seven of the nine gas wells have deliverabilities greater than 449 MCF/D, the gas well allowable under Statewide Rule 49(b). The gas wells in this low permeability reservoir have relatively small estimated ultimate recoveries (1/4 and 3/4 BCF), and there is no need to curtail their flush production under Rule 49(b) unless curtailed allowables will improve oil recovery.

A step-rate test was conducted on the Noelke 4 No. 2H between August 19 and September 9, 2002, which showed that the well's production is not rate sensitive. The test data are summarized in the following table:

Choke size	Ave. oil prod.	Ave. gas prod.	Ave. water prod.	Ave. gas/oil ratio
64/64th inch	56 barrels	2596 MCF	30 barrels	46,787 cu.ft/bbl
46/64th inch	42	2173	18	51,554
41/64th inch	36	1727	8	47,510
38/64th inch	29	1317	6	45,202
64/64th inch	55	2507	41	45,307

The average gas/oil ratio is not significantly lower on the smallest choke size than it is on the largest. The average water/gas ratio was relatively high on the largest choke size, indicating the well is capable of unloading liquids at that rate.

The Noelke 4 Well No. 2H had 250 MMCF of overproduction as on October 1, 2002. The other two active gas wells carried in the Sheffield, SE (Devonian) Field are operated by Pure Resources and Silver Pines Energy Corp. Both wells are over a mile from EOG's wells. Correlative rights will not be damaged if the overproduction of the Noelke 4 No. 2H is canceled. Requiring this well to produce at a reduced rate to make-up its overproduction would cause waste.

FINDINGS OF FACT

1. Notice of this hearing was given to all operators in the Sheffield, SE (Devonian) Field on October 4, 2002.
2. The Sheffield, SE (Devonian) gas field was discovered in 1980 at a depth of 8941', and has nine gas wells.
3. The first oil was completed in April, 2002, with an initial potential of 100 BOPD and a gas/oil ratio of 2510 cubic feet per barrel. This well is already shut-in after producing only 4360 BO and 16,460 MCF.

4. The second oil well, EOG's Noelke 4 Lease Well No. 2H had an initial potential of 131 BOPD with an oil gravity of 40 degrees and a gas/oil ratio of 31,267 cubic feet per barrel.
5. The Noelke 4 No. 2H's ultimate production is predicted to be 11,000 BO and 609 MMCF.
6. The Statewide allowable for oil wells at this depth is 142 BO and 284 MCF of gas per day, and the gas wells are limited to 449 MCF per day under Statewide Rule 49(b).
7. Test results on the Noelke 4 No. 2H show that the well's gas/oil ratio increases insignificantly when the well is produced at higher rates.
8. The only wells in this field with operators other than EOG are at least a mile away the EOG wells.
9. EOG's Noelke 4 Lease Well No. 2H has overproduction of 250 MMCF and requiring this well to make up overproduction is not necessary to protect correlative rights.
10. The reservoir is heterogeneous and the producing characteristics of the various wells in the field vary significantly even when the wells are close together.
11. Increasing gas production from the gas wells will not harm the oil recovery.

CONCLUSIONS OF LAW

1. Proper notice was given as required by statute.
2. All things have been done or occurred to give the Railroad Commission jurisdiction to resolve this matter.
3. The requested increase in gas allowable for the EOG Noelke 4 Lease Well No. 2H will not cause waste and will protect correlative rights.
4. Allowing all wells in the Sheffield, SE (Devonian) Field to produce up to 3000 MCF per day will not cause waste and will promote conservation and additional drilling.

EXAMINER'S RECOMMENDATION

Based on the above findings and conclusions, the examiner recommends that the oil wells in the Sheffield, SE (Devonian) Field be allowed to produce up to 3000 MCF per day. All overproduction for the EOG Resources Noelke 4 Lease Well No. 2H should be canceled.

Respectfully submitted,

Margaret Allen

Technical Hearings Examiner

Date of Commission Action: January 7th, 2003